REBUTTAL TESTIMONY OF

R. NICHOLAS WINTERMANTEL

ON BEHALF OF

DOMINION ENERGY SOUTH CAROLINA, INC.

DOCKET NO. 2023-9-E

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is R. Nicholas ("Nick") Wintermantel, and my business address is 3000 Riverchase Galleria STE 575, Hoover, AL, 35224.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am a Principal at Astrapé Consulting. Astrapé is a consulting firm that provides expertise in resource planning and resource adequacy to utilities across the United States and internationally.

Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN TIS PROCEEDING?

A. Yes, I did. I previously filed direct testimony on behalf of Dominion Energy South Carolina, Inc. (DESC).

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to testimony from ORS Witness Phil Hayet of J. Kennedy and Associates, Inc. and CCL/SACE and Sierra

Club Witness Derek Stenclik regarding the DESC 2023 Planning Reserve Margin Study. My rebuttal testimony is organized by each intervenor.

Q. PLEASE SUMMARIZE ANY CRITIQUES FROM ORS AND ORS WITNESS PHIL HAYET IN REGARD TO THE DESC 2023 PLANNING RESERVE MARGIN STUDY.

A. ORS stated in its report "Overall, the Company's 2023 resource adequacy analysis is reasonable and represents an improvement compared to the analysis that was performed in the 2020 IRP." ORS and Witness Hayet have one recommendation regarding future resource adequacy studies. "DESC should fully document the extreme winter weather statistical analyses and demonstrate that the models reasonably reflect winter loads during extreme low temperatures in future IRPs. The Company should also report on the Company's findings in the Stakeholder Working Group."

Q. HOW DO YOU RESPOND TO MR. HAYET'S RECOMMENDATION?

A. Astrapé Consulting recognizes the sensitivity the study has to modeling load response for extreme low temperatures. While Astrapé Consulting stands behind its regression analysis which extrapolates load response for those extreme temperatures, I agree with ORS that the analysis should continue to be reviewed and presented to stakeholders for future IRPs. The variance in load due to weather versus the load forecast that was modeled in the DESC 2023 Planning Reserve Margin Study was presented to stakeholders in December of 2022 and Astrapé

conducted additional extreme bookend sensitivities as part of the study. As discussed in my direct testimony, both an extreme low and high load response sensitivity were conducted to understand the possible impact the assumption could have on planning reserve margin. The Company should continue to review this analysis for future IRPs.

Q. MOVING ON TO CCL/SACE WITNESS DEREK STENCLIK, PLEASE SUMMARIZE HIS TESTIMONY IN REGARD TO THE DESC 2023 PLANNING RESERVE MARGIN STUDY?

A. Witness Stenclik stated that the DESC 2023 Planning Reserve Margin Study ("PRM and ELCC Study") is an improvement to the 2023 IRP. He stated that the "methodology employed a sequential, Monte Carlo, loss of load analysis evaluating resource adequacy across various weather years, different generator outage draws, captured the benefits of solar and storage added in conjunction with one another, and considered availability of imports from neighboring utilities during tight supply conditions." Witness Stenclik has four critiques of the study which I will respond to separately.

1. Witness Stenclik argues the ELCC study should study higher levels of solar and storage as part of the next IRP.
2. Witness Stenclik points out that the DESC 2023 Planning Reserve Margin Study did not show the solar capacity factors and adjustments made in the modeling.

3. Witness Stenclik states that solar and storage resources were not treated fairly versus new gas options from a capacity accreditation perspective and recommends changes for the next IRP.
4. Witness Stenclik summarizes the fact that the majority of the LOLE events occur in the coldest winter periods which so happens to be in the early 1980's and "worries that DESC is being overly conservative in its winter peaks by layering in assumptions on the risk of winter peaks".

Q. WHAT IS WITNESS STENCLIK'S FIRST CRITIQUE?

A. Witness Stenclik takes issue with the solar and storage penetration levels evaluated in the ELCC portion of the DESC 2023 Planning Reserve Margin Study. The study analyzed up to 2,935 MW of solar capacity and incremental 900 MW of battery storage capacity. The 900 MW of battery storage is in addition to the 576 MW of existing pump storage on the system. Ultimately 1,476 MW on a 5,000 MW system were analyzed which represents approximately 30% penetration of storage as a percent of system peak. Witness Stenclik recommends evaluating further levels for the next IRP.

Q. HOW DO YOU RESPOND TO WITNESS STENCLIK'S FIRST CRITIQUE?

A. ELCC studies are complex and require a significant amount of time and processing power, and DESC has made significant improvement compared to its previous IRP updates. For future IRPs, I expect battery storage ELCC curves will be updated, and additional storage tranches will be evaluated. However, I believe

the penetration analyzed for this study provides sufficient information for critical resource decisions over the next 5-10 years and also provides a basis for the longer-term periods which will have the benefit of seeing future IRP updates before any of those decisions are made. Regarding solar penetration alone, the winter ELCC of solar will continue to be low so I do not believe simulating substantially higher solar penetrations above 3,000 MW would add significant value but could be analyzed with higher battery storage tranches.

Q. WHAT IS WITNESS STENCLIK'S SECOND CRITIQUE AND HOW DO YOU RESPOND?

A. Witness Stenclik takes issue that the DESC 2023 Planning Reserve Margin Study didn't discuss the solar capacity factor adjustments in detail. As stated in the study report, NREL shapes with an inverter loading ratio of 1.0 were scaled to specific capacity factors by unit at the request of DESC. For modeling purposes this was simply done using the SERVM inverter loading ratio logic which scales all hours of the year up or down by the same percentage to achieve the desired capacity factors by solar resource. The solar capacity factors as modeled in SERVM for the 2026 study year across the 1,336 MW fleet ranged from 20% to 26%. Witness Neely discusses the recommended capacity factors provided in more detail which are based on actual operating experience. Given the low winter ELCC of solar already due to timing of loss of load events being in the winter mornings, I do not expect the capacity factor adjustments to have any impact on the study results.

Q. PLEASE DESCRIBE WITNESS STENCLIK'S THIRD CRITIQUE OF THE DESC 2023 PLANNING RESERVE MARGIN STUDY AND HOW DO YOU RESPOND.

A. Witness Stenclik states that solar and storage resources were not treated fairly versus new gas options from a capacity accreditation perspective. Witness Stenclik recognizes that in a vertically integrated utility framework it isn't necessary to develop an ELCC for accrediting capacity for every existing resource on the system. Witness Stenclik is correct that it is important to accurately depict accreditation for marginal resources. As discussed in my direct testimony, the solar and storage resources weren't compared against perfect load but load that reflected a 4% outage rate. The 4% outage rate represents a proxy for the equivalent forced outage rate for a new gas resource. By doing this, the solar and storage resource ELCC values are evaluated on par with a new thermal resource. Regarding weather related and fuel supply outages during cold weather periods, Witness Walker discusses the reliability of these new gas resources and the expected behavior during cold snaps and the ability to secure fuel during these cold weather periods which is why no additional accreditation penalty was warranted. Similarly, it is difficult to determine the forced outage rates of new energy storage resources which have been given a 3% forced outage rate for this analysis (assumed to be lower than new gas resources). Initial analysis performed by the consulting firm E3 on California storage resources shows that forced outage rates have been between 8% and 12%

and the 3% assumption may need to be adjusted as part of the next IRP.[1] Solar resources were modeled with no forced outages for the ELCC analysis within SERVM which provides an additional benefit to solar compared to gas.

Q. WHAT IS WITNESS STENCLIK'S FOURTH CRITIQUE?

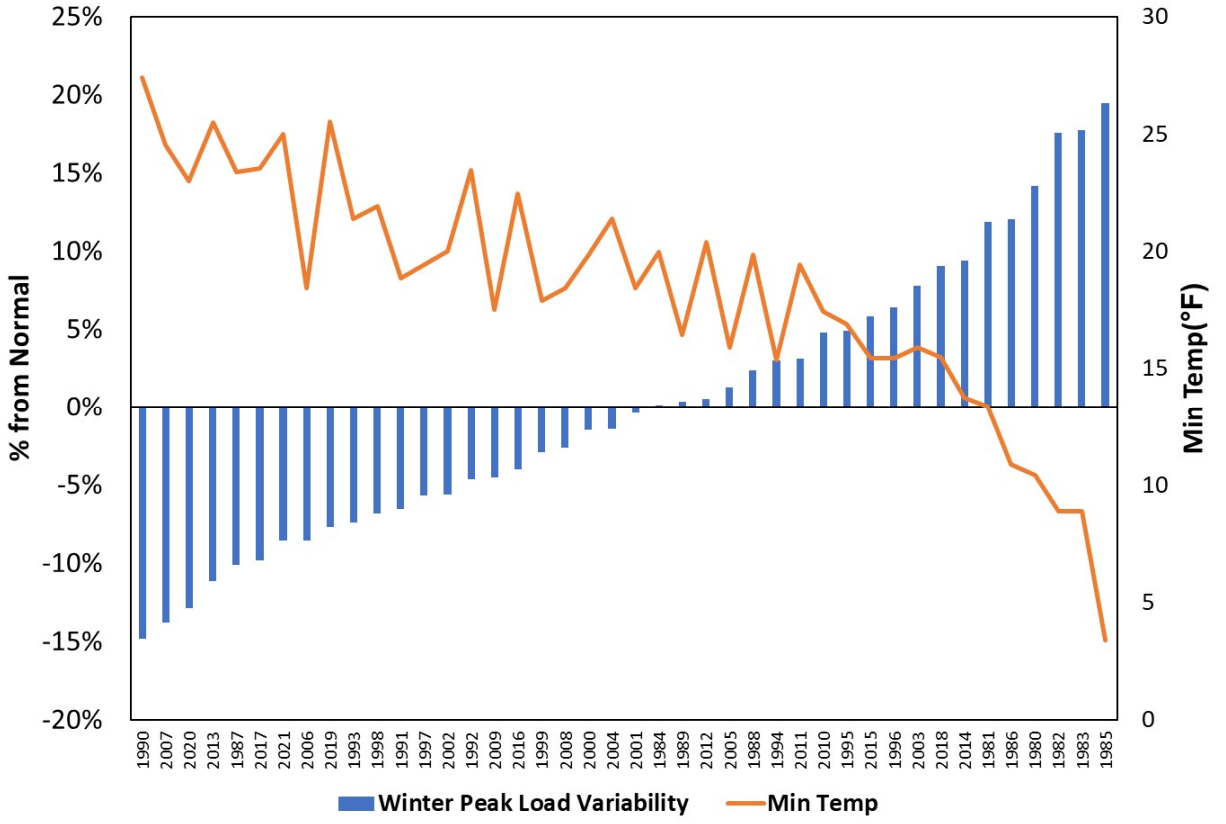
A. Witness Stenclik summarizes the fact that most of the LOLE events occur in the coldest winter periods which so happens to be in the early 1980's and "worries that DESC is being overly conservative in its winter peaks by layering in assumptions on the risk of winter peaks". Witness Stenclik also thinks there is potential for double counting of winter risk which may already be included in the DESC 2023 Planning Reserve Margin Study but did not formulate a recommendation on this fourth critique.

Q. HOW DO YOU RESPOND TO WITNESS STENCLIK'S FOURTH CRITIQUE

A. It is typical for a LOLE study to only show load shed in a few extreme weather years as seen in the DESC 2023 Planning Reserve Margin Study. The following chart shows the variance in load due to winter weather around the normal weather peak for the 42 weather years modeled. On the secondary axis, the minimum temperature of each year is displayed. It is no surprise that the early 1980's drive the study as record low temperatures were seen during that period. It is also expected the highest load response would be in these years. There is no

[1] PowerPoint Presentation (aps.com) – see slide 45

reason to omit these occurrences from the study and recent events seen nationally and locally such as Winter Storm Uri and Winter Storm Elliott make it important to leave these extreme temperatures in the analysis.



As I responded to Witness Hayet, the load response during these extreme cold temperatures should continually be reviewed as part of future planning reserve margins studies and more data is available. The load response in the DESC 2023 Planning Reserve Margin Study is based on recent historical data and was presented to stakeholders in December of 2022.

In response to the potential double counting, because the 42 synthetic shapes used in the study were scaled such that the average peaks of the last 30 years[2] would equal the weather normal forecast, the reserve margin percentage calculated in the study is essentially indifferent to the magnitude of the peak load forecast. The reserve margin percentage represents only the additional reserves needed to cover uncertainty of weather, economic load forecast error, and unit performance uncertainty on the system above the normal weather load forecast, and therefore there is no double counting.

Q. **BASED ON THE CRITIQUES PROVIDED, PLEASE SUMMARIZE YOUR CONCLUSIONS.**

A. Overall, both ORS Witness Hayet and CCL/SACE and Sierra Club Witness Stenclik state the DESC 2023 Planning Reserve Margin Study is an improvement from past IRPs. Astrapé used industry best practices in performing the study and the study utilizes reasonable assumptions and provides valid results. The study will be updated periodically for future IRPs and allow for new data to be included as the DESC system changes. Any offered critiques were provided as recommendations for the next IRP such as continuing to review cold weather load response and increasing the penetrations of solar and storage for ELCC analysis. I do, however, disagree with Witness Stenclik that new solar and storage resources were not treated equally with new gas for the reasons stated in my direct and rebuttal testimony.

[2] The 30-year average is used because DESC'S load forecast is based on normal weather over the last 30 years.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.